The Walt Disney Company

Preston R. Padden
Executive Vice President
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January 14, 2003

United States Patent and Trademark Office
Office of Legislative and International Affairs
Room 902
2121 Crystal Drive
Arlington, VA 22202

Attention: Velicia Steadman

Dear Ms. Steadman:

In response to the Request for Written Comments published by the U.S. Patent and Trademark Office in the Federal Register on December 9, 2002, The Walt Disney Company is pleased to submit the enclosed written comments to assist the PTO in preparation of its report to Congress required by the Technology, Education and Copyright Harmonization Act of 2002.

The Walt Disney Company also hereby requests to testify at the hearing tentatively scheduled for February 4, 2003.

If you have any questions concerning this submission or our request to testify, please contact Terri Southwick at 202-222-4700.

Sincerely,

Preston R. Padden

Enclosure

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COMMENTS OF
THE WALT DISNEY COMPANY
ON
TECHNOLOGICAL PROTECTION SYSTEMS
FOR DIGITIZED COPYRIGHTED WORKS

JANUARY 14, 2003

INTRODUCTION

As can been seen from the attached charts, there is no shortage of protection technologies on the market or groups working to develop new ones. What there is a shortage of is cooperation among and within industries, and compatibility and effectiveness of technologies.

There are tremendous divisions between the content, information technology and consumer electronics industries. Some in the latter two industries claim that if the content industry would simply protect its works technologically at their source, there would not be the online piracy problems currently facing copyright owners nor the threat of an exponential increase in such problems with the widespread adoption of broadband technology. While some of the piracy facing us today has as its source pre-release copies of software, sound recordings and motion pictures, that fact has little, if any, relevance to the overall problem.

We must proceed from the assumptions that there will always be leaks and that those leaks – no matter the source – when aided by broadband connections and peer-to-peer technology (both of which are not only legal, but in other contexts, extremely beneficial), will result in the flooding of the legitimate marketplace with illegitimate, but free and perfect, copies that can be used, reproduced and retransmitted using virtually any of the digital players, burners and personal computers on the market today. Unilateral action by copyright owners cannot prevent or stop that flooding. The content, IT and CE communities must realize that there is a common interest (with the consumer) in creating a secure environment for copyright works and containing that flooding.

The attached chart of organizations – which includes some cross-industry groups – belies the progress being made. While work is being done in certain areas, including with regard to the broadcast flag, which would not prevent any copying but would restrict Internet retransmission of digital broadcast television programs, there has been hardly any discussion of – let alone any progress made on – the problem of peer-to-peer piracy that plagues and will increasingly harm the market for copyrighted works.

Given unlimited time, will the private sector come to agreement on solutions? Probably not. There will continue to be infighting and competitive maneuvering that will prevent the kind of timely response that is necessary. For example, the DVD CCA has been working on the specifications for and the evaluation of a consensus watermark for more than five years. Last summer, various industry players were finally on the verge of adopting a consensus watermark for DVDs, but some participants failed to embrace it. Thus, while solutions have been developed that are acceptable to many, constant disagreements make the selection of even this one consensus watermark by the private sector appear less likely today than a year ago.

But given limited time, could the private sector come to agreement? Probably. The assault on intellectual property rights has reached a point where government facilitation of a private sector solution is needed. Such facilitation – and the resulting agreement on

standards for the needed technological protection – will benefit not just members of the copyright industry (because their rights will be more effectively protected), the IT industry (because broadband connections will be more widely utilized), and the CE industry (because devices will be more quickly and widely adopted), but also, and perhaps more importantly, the members of the public.

The "free for all" that is taking place online today – with an estimated half a million illegal downloads of movies and a hundred million illegal downloads of songs each and every day – appears to be giving the public "something for nothing." But, it is not in the public's interest for the creation of high value content to be undermined and for the marketplace for that content to be choked one pirated copy at a time. That marketplace cannot continue to have any vitality, and certainly cannot expand and deliver more of what consumers want, if intellectual property rights are not respected.

Effective technological protection of copyrighted works, as well as the stemming of the online flood of unlawful copies, will give consumers more choices, not fewer. There will be more content available online, more ways of accessing that content, more portability, and more flexibility in pricing options if there is a robust, competitive DRM market and, when the leaks come, a last line of defense (whether it be persistent watermarks read by all players or other standardized, consensus technology) to hold back the tide.

ANSWERS TO QUESTIONS

(1) What technological protection systems have been implemented, are available for implementation, or are proposed to be developed to protect digitized copyrighted works and prevent infringement, including any upgradeable and self-repairing systems?

Technological protection systems for intellectual property in digital form fall primarily into three major categories: embedded marks or watermarks, DRM (Digital Rights Management), and CA (Conditional Access). A chart attached hereto (Attachment A) provides an extensive, but by no means fully comprehensive, list of products and technologies that have been developed and that fall into one or more of these three major categories or associated categories.

Watermark technology can be used for both forensic tracking of content and as an agent for delivering information about the content and its authorized use. A watermark cannot in and of itself control or prevent unauthorized use of the content. For that, a watermark detector and associated technology and enforcement mechanisms are needed – in receiving software and/or hardware. The listed watermark technologies can be applied only to the content type specified in the "Watermark" column of the attached chart: Text (T), Image (I), Audio (A), Video (V), 3D graphics (3), Software (S), or Webpage content (W).

Conditional access (CA) technology is intended to protect content from the distribution point (for example, a satellite or cable plant) to the point where it enters the consumer's personal digital environment. Conditional access systems usually rely on "smartcards" or other hardware containing unique information for prevention of unauthorized access and use of the content. The "Conditional Access" column of the attached chart provides a key point about each system listed.

Digital Rights Management (DRM), as used here, refers to technologies that are intended to protect content and authorize its use within the consumer's personal digital environment. Some DRM technologies protect content as it is transmitted from the distribution point to the consumer's environment; a few are limited to protecting content within a single device component, such as a hard drive. The remainder fall somewhere in between. The "DRM" column of the attached chart offers a key comment about each technology listed.

(2) What systems have been developed, are being developed, or are proposed to be developed in private voluntary industry-led entities through an open broad-based consensus process?

Many of the organizations that are involved in development or standardization of protection systems and technologies are listed on an attached chart (Attachment B). The brief "Description" of each organization provides an indication of the extent to which the organization is an open, broad-based consensus body. The farthest right column lists specific systems that have been developed or are in the process of being developed through these organizations.

(3) Consistent with the types of information requested by Congress, please provide any additional comments on technological protection systems to protect digitized copyrighted works and prevent infringement.

The following additional sites, articles and materials may be useful in your study.

- 2002 ATP Awards Announced (http://www.atp.nist.gov/awards/2002list.htm) (material concerning Content Specific Camcorder Jamming for Digital Projectors (Cinea) and XML Encryption in Native XML Database (Conclusive Technologies)).
- Cox, Miller, and Bloom, Digital Watermark (Harcourt Academic Press 2002).
- "Microsoft, Intel Reject DVD Watermark Proposal," National Journal's Technology Daily (August 7, 2002).
- "Macrovision Decries Lack of DVD Video Watermark," Audio Week (November 4, 2002).
- "DVD-Watermark Remains in Limbo Past Aug. 1 Deadline," Consumer Electronics (August 5, 2002).
- NIST Computer Security Resource Center activity (http://csrc.nist.gov).

Company Name	URL	Watermark	DRM	Conditional Access	Other
		Text, Image, Audio, Video, 3D, Software, Webpage			
Adobe	www.pacific.adobe.com		Acrobat intended to prevent unauthorized viewing of documents		
Aladdin	www.ealadding.com		Privilege Software Commerce Platform intended to secure software distribution		
Alchemedia	www.alchemedia.com		For protection of web document display		
Alpha-Tec Ltd	www.alphatechltd.com	I,A,V,3			
AlpVision	www.alpvision.com	I,V			
Atabok	www.e-parcel.com		VCN Web intended to control access to web content and authenticate web users		
Blue Spike	www.bluespike.com	I,A			
Canal Plus (Media Guard)	www.canalplustechnologies.com			Smartcard	
Certicom	www.certicom.com		For encryption of content during transmission and storage; wirelesss security		
Compris	www.compris.com				
ContentGuard	www.contentguard.com		For protection of XrML-based web content (see www.xrml.org)		
CopySeal	Copyseal.com.au		Intended to protect webpage content from unauthorized copying		
Datamark (UK)	www.datamark.com.uk	T,I			
Datamark Technologies	www.datamark-tech.com	T			
Digimarc	www.digimarc.com	I, A, V			Piracy Search Services
Digital World Services	www.dwsco.com				DRM-independent content distribution services
DMDsecure	www.dmdsecure.com				Rights and access management that overlays on other DRM systems (MS, Real, Adobe, etc.)
DMOD-Digital Media on Demand	www.dmod.com		DRM for content during the production and post-production process.		
Elisar	www.elisar.com		Intended to protect webpage		

			content from unauthorized copying.		
EMeta Corp.	www.emata.com				Rights and access management system that is intended to overlay other DRM systems (Ms, Real, Adobe, etc.)
Ewatermark.com	www.ewatermark.com	I			
Flexplay	www.flexplay.com				Intended to physically degrade prerecorded DVDs within a predetermined time.
Fraunhofer CRCG	www.crcg.edu	T,I,A,S	A JAVA mobile agent, which is a DRM-variant, intended to encrypt and protect content and code		
Harmonic (SimulCrypt)	www.harmonicinc.com		Intended to work in STB and middleware provider solutions for satellite, cable, VOD, and IP-over-satellite		
IBM Electronic Media Management System (EMMS)	www.ibm.com		Integrated DRM system including mastering, clearinghouse, and client software development kit modulets		
Info2clear	www.info2clear.com				For registration and certification of content (e-books and music), but not DRM
Infraworks	www.infraworks.com		InTether intended to bind content and usage rules to a specific hard drive or prerecorded CD		
InterTrust Technologies Corp.	www.intertrust.com		RightsSystem for encryption and wrapping of content to be downloaded or streamed.		
Irdeto Access	www.irdetoaccess.com			Irdeto Access smart card intended to work with DVB-compliant set top boxes; MPEG-2, MPEG-4, Windows Media, and Real platforms	
Liquid Audio	www.liquidaudio.com		Intended to protect streamed and downloaded audio using liquidaudio DRM or a 3rd party DRM.		
Lock-Out	www.lock-out.net				Wireless Java iButton programmable key intended

					to protect content on a physical device.
Lockstream	www.lockstream.com		Client/server DRM for managing secured communication and content control for wired and wireless devices.		
Macrovision	www.macrovision.com	A,V	Intended to provide copy protection for analog (and soon digital) audio and video, wrappers for software		
Markany	www.markany.com	I,A,V,W	Intended to protect webpage content from unauthorized copying		
MediaSecTechnologies	www.mediasec.com	T,I,A,V			Watermarks for content authentication
Microsoft	www.microsoft.com	I,A,V	Intended as limited DRM protection in general computing devices (PCs) today, and as expanded DRM protection in a future Windows OS upgrade with a "Trusted PC" environment		Watermarks for forensic tracking
Midbar Tech Ltd. (Cactus Data Shield)	www.midbartech.com				Audio CD (optical media) protection intended to prevent CD ripping; (in development; secure, controlled P2P content distribution system)
MTL Systems, Inc.	www.mtl.com	I			
Musicrypt Inc.	http://216.191.60.85/home.asp		Non-invasive biometric-based systems for internet music streams		
Nagra (Kudelski Group)	www.nagra.com			NagraVision and related products use smartcards for digital TV and broadband internet content	
NDS	www.nds.com			VideoGuard smartcard CA technology for cable/satellite linear pay TV, interactive TV, and PVR TV, as well as datacasting and broadband networks	
NetActive	www.netactive.com		Windows-compatible DRM system for content distribution via download, disk, or peer-to-peer		

Open Loop Inc.	www.openloop.co.jp		Real-time encryption for MPEG-4 stream, including video, to 3G mobile phones		
Philips	www.digitalnetworks.philips.com	A,V (Cryptotec wm)		CrytoWorks smart card uses DVB SimulCrypt intended to protect Direct-to-Home applications (cable/satellite), including datacasting and IP delivered content.	
PlayApp	www.playapp.com				Physical USB-port plug-in key for content protection on one physical device
RealNetworks	www.realnetworks.com		Partially open-source media player with a proprietary DRM component		
Rights Market	www.rightsmarket.com		RightsEnforcer intended to protect webpage content and email attachments from unauthorized access and use		
Savantech	www.savantech				Photon Commerce is a rights and access management systems that overlays on other's DRM solutions (MS,Real, Adobe, etc.)
Sealed[media]	www.sealedmedia.com		Limited DRM (documents, MPEG-1&4, Quicktime, others) that is intended to offer persistent control		
SealTronic	www.sealtronic.com	T,I,V	DRM for document, image, and downloaded or streaming video on the web		
Secure Media			Encryptonite DRM for Video-on-Demand over the web		
Signum Technologies	www.signumtech.com	I,A,V,W			
Spectra Systems Corp.	www.spectra-science.com				Intended to physically degrade prerecorded DVDs in a predetermined time
SunnComm, Inc.	www.sunncomm.com				For physical audio CD protection (intended to prevent unauthorized play on PCs), and intended to protect against unauthorized viral distribution via downloaded authorization key.
Thomson Multimedia	www.thomson-multimedia.com www.smartright.org	SmartRight uses smartcard technology for protection of			

		MPEG2 transport streams in the home. Next generation intended to protect other formats, such as mp3 and text.			
Trymedia	www.trymedia.com		DRM technology integrated into software/game code that is intended to allow specific usage rules, including trial-to-purchase.		
Unicate BV	www.unicate.nl				3D nanotechnology security token in physical DVD, CD, CD-ROM
Verance	www.verance.com	A			
Verisign	www.verisign.com				For authentication of point-to-point parties for secure and trusted documents and e-commerce transactions
VWM Group		Watermarks for DVDs and potentially, DTV signals. Macrovision administers license.			
Waveexpress	www.wavexpress.com		Hardware/software-based video and software system for PC and STB.		
Xat.com	www.xat.com	I			

Organization	URL	Description	System(s)/Proposals
DTLA – Digital Transmission Licensing Authority	www.dtcp.com	DTCP technology is a cryptographic protocol that protects audio/video entertainment content from unauthorized copying, interception, and tampering as it traverses digial buses (example:1394 / firewire). The technology was developed by five companies (5C); Sony, MEI, Intel, Toshiba, and Hitachi. DTLA licenses the technology.	Five companies developed the DTCP link encryption content-protection technology. The technology works now on 1394/Fireware networks, and is being mapped to USB and MOST networks. Two studioes have licensed the technology. Licensing terms related to compliance and robustness are still being negotiated with others.
DVB-Digital Video Broadcasting	www.dvb.org	DVB is a consortium of over 300 broadcasters, manufacturers, network operators, software developers, regulatory bodies and others in over 40 countries committed to designing global standards for the delivery of digital television and data services. DVB commercial and technical efforts include MHP (Multimedia Home Platform), CP (Copy	DVB technical specifications for CA (Conditional Access)systems are in use in products that have been on the market for years. DVB is currently developing technical specifications for content control within the digital consumer environment.

		Protection), PVR (Personal Video Recorders), BSS (Broadband Satellite Systems), WHN (Wireless Home Networks), IPI (Internet Protocol Infrastructure), SMI (Storage Media Interoperatability) and RC (Return Channels).	
DVD CCA –DVD Copy Control Association	www.dvdcca.org	DVD CCA is a non-profit corporation responsible for licensing and enforcing CSS (Content Scrambling System) to manufacture of DVD hardware, discs, and related products. It is also responsible for selecting and licensing technology that will carry CCE (Content Control Information) within content.	CSS (Content Scrambling System) has been adopted by the content and DVD technology community and is on many prerecorded DVD discs released today. The selection of a watermark technology to carry CCI (Content Control Information) is being negotiated.
DVD Forum	www.dvdforum.org	DVD Forum defines technical standards for prerecorded and some recordable DVD formats (DVD-r,-rw,ram). WG9 (Working Group 9) addresses copyright protection. DVD Forum has more than 230 member companies and 10 founding companies (Hitachi, MEI, Pioneer, Philips, Sony, Thomson, Time Warner, Toshiba, JVC).	
IETF – Internet Engineering Task Force	www.ietf.org	The IETF is a non-membership international community of technologists developing standards and protocols for the internet. The Security Area Working Group address network and data flow security issues.	
MPEG- Moving Picture Expert Group	http://mpeg.telecomitalialab.com	MPEG is a working group of the ISO (International Standards Org.) charged with developing standards for the coded representation of digital audio and video. MPEG-1:technologies like Video CD and MP3 MPEG-2:technologies like digital TV and DVD MPEG-4:technologies like multimedia on the fixed and mobile internet MPEG-7:description and search on audio and video conent MPEG-21: multimedia framework	MPEG is very actively working toward the selection of a consensus rights data dictionary and rights language. XrML is a leading candidate.
Open eBook Forum	www.openebook.org	Open eBook Forum is an international trade and standards organization composed of hardware and software companies, publishers, authors, users of electronic books, and related organizations whose common goals are to establish specifications and standards for electronic publishing. The Rights and Rules Working Group is working to create an open and commercially viable standard for interoperability of DRM	Open eBook Forum has selected XrML as its rights management language.

		systems.	
OMA – Open Mobile Alliance (formerly the WAP Forum)	www.openmobilealliance.org	OMA is working to develop seamless application interoperability in the mobile (i.e. wireless) communication industry. OMA has more than 200 major corporate members.	OMA recently adopted a DRM standard which, among other things, uses a flag intended to prevent the unauthorized forwarding of content. Major mobile equipment manufacturers, including Ericsson and Nokia, are implementing this specification.
SMPTE – Society of Motion Picture and Television Engineers	www.smpte.org	SMPTE is an internationally recognized standard-setting body for motion imaging. It develops technical specifications, engineering practices, and tutorial material that are compatible with other bodies international engineering documents whenever possible. Working Group topics include Metadata and Wrapper Technology (W25) and Digital Cinema content security (DC28)	SMPTE is refining its specification for a digital cinema content security environment.
W3C – World Wide Web Consortium	www.w3.org	W3C develops interoperable technologies (specifications, guidelines, software, and tools) for the internet. Its DRM initiative is currently dormant and monitoring MPEG's content protection activities.	
4C Entity	www.4centity.com	Four companies (MEI, Intel, Toshiba, IBM) have proposed a Content Protection System Architecture (CPSA). The architecture includes Digital Transmission Content Protection (DTCP), Content Protection for Recordable Media and Prerecorded Media (CPRM/CPPM), Conditional Access (CA) technology, and a video and 4C audio watermark for embedding Content Control Information (CCI) within the content.	
ATSC – Advanced Television Systems Committee	www.atsc.org	ATSC is an international non-profit organization that develops voluntary technical standards for TV broadcast spectrum issues, including CA (Conditional Access) guidelines for terrestial broadcastTV (ATSC Standard A/70).	The ATSC membership has approved a place in the terrestrial broadcast signal for the Broadcast Flag.
CableLabs	www.cablelabs.org	CableLabs is a nonprofit R&D consortium pursuing new cable telecommunications technologies and helping cable operators integrate those advances into their business objectives. Their OpenCable initiative is developing guidelines for a common platform for advanced interactive cable services. OpenCable will allow any compliant STB (set-top-box) to accept signals from an cable	CableLabs' membership has release final versions of the core technical specifications for OpenCable; their design for a common platform for advanced interactive cable systems. Licensing terms related to compliance and robustness are still being negotiated.

		systems proprietary POD (cable wire connector). OpenCable includes: OCAP – OpenCable Application Platform Specification PHILA –Pod-Host Interface License Agreement	
CPTWG – Copy Protection Technical Working Group	www.cptwg.org	CPTWG is an informal forum for content creators and owners, consumer electronics and computer companies, and interested consumers and consumer advocates to meet and discuss technical issues related to content protection. The Broadcast Protection Discussion Group evaluated the implementation of Broadcast Flag Technology in the digital terrestrial broadcast signal.	The Broadcast Protection Discussion Group completed a technical evaluation on June 3, 2002 of Broadcast Flag technology to protect digital terrestrial broadcast content.
Digital Content Protection, LLC	www.digital-cp.com	This organization licenses HDCP (High-bandwidth Digital Content Protection) technology	HDCP (High-bandwidth Digital Content Protection) technology is ready for implementation., and has been endorsed by Disney, Warner Bros., Fox, and other content companies. Licensing terms are being negotiated.